

Claims

WHAT IS CLAIMED IS:

- 5 1. An electronic device for at least one of transmitting and receiving signals, comprising:
a housing;
at least a GPS (Global Positioning System) antenna operatively connected to the housing;
10 a deployment system operatively connected to the GPS antenna, the deployment system moving the GPS antenna from a docked position relative to the housing to a deployed position relative to the housing in response to an occurrence of at least one predetermined deployment event.
- 15 2. The device according to claim 1, wherein the electronic device is a handheld two-way radio transceiver.
3. The device according to claim 1, wherein the GPS antenna is a monopole antenna substantially contained in an antenna chamber in the housing, wherein
20 the deployment system has an ejection device, and wherein the GPS antenna has a connection section operatively connected to the ejection device which moves the GPS antenna from the docked position to the deployed position.
4. The device according to claim 3 wherein the ejection device is a spring
25 member, and wherein a latch mechanism retains the monopole GPS antenna in the antenna chamber for a docked position.
5. The device according to claim 3 wherein the ejection device is a fusible link which connects the connection section of the GPS antenna to a retaining
30 surface of the antenna chamber.
6. The device according to claim 3, wherein the ejection device is a compressed gas device that is located between the connection section of the GPS antenna

and a retaining surface of the antenna chamber when the GPS antenna is in the docked position.

- 5 7. The device according to claim 3 wherein the ejection mechanism is a motor operatively connected to the GPS antenna, and wherein the GPS antenna and the antenna chamber have a gear structure such that when the motor is energized, the GPS antenna moves from the docked position to the deployed position.
- 10 8. The device according to claim 3, wherein the ejection mechanism is a solenoid having a coil and a plunger, wherein the solenoid is contained within a bottom area of the antenna chamber, wherein the plunger has one end connected to the connection section of the GPS antenna, and wherein upon energizing the coil of the solenoid, the plunger moves the antenna from the docked position to the
15 deployed position.
9. The device according to claim 3, wherein the ejection mechanism is an airbag-type device, wherein the GPS antenna is an inflatable monopole GPS antenna that is operatively connected to the airbag-type device, and wherein upon
20 receiving a signal the airbag-type device inflates the GPS antenna thereby moving the GPS antenna from the docked position to the deployed position.
10. The device according to claim 1, wherein the GPS antenna is an inflatable antenna, wherein the GPS antenna has a compressed configuration for the
25 docked position and inflated by the control system to a monopole GPS antenna configuration for the deployed position.
11. The device according to claim 10, wherein the GPS monopole antenna is deployed by an airbag-type device.
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12. The device according to claim 10, wherein the monopole GPS antenna is deployed by a compressed gas device.

13. The device according to claim 1, wherein the device further comprises a quadrifilar helix cellular/GPS antenna on which an inflatable monopole GPS antenna is operatively connected.
- 5 14. The device according to claim 13 wherein the inflatable GPS monopole antenna is inflated to move the GPS monopole antenna from a the docked position to the deployed position by one of an airbag-type device and a compressed gas type device.
- 10 15. The device according to claim 1, wherein the device further comprises a microstrip patch antenna on the housing for use as at least one of a cellular antenna and a GPS antenna, wherein the microstrip patch antenna has an aperture through which a monopole GPS antenna is deployed from the docked position within the housing of the device to the deployed position substantially external to the housing.
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16. The device according to claim 1, wherein the GPS antenna is a monopole GPS antenna having a first end attached to the housing and a second end attached to a microstrip patch antenna, wherein the microstrip antenna is at least a cellular patch antenna, wherein in the docked position the second end of the GPS antenna is substantially adjacent the housing and wherein in the deployed position the second end of the GPS antenna is orientated away from the housing.
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17. The device according to claim 1, wherein the GPS antenna is rotated from a docked position adjacent the housing to a deployed position in which the GPS antenna has one end positioned away from the housing.
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18. A method for deploying a GPS (Global Positioning System) antenna in a handheld two-way radio transceiver, comprising the steps of:
- activating at least one key on a keypad of the transceiver;
 - transmitting in response thereto a cellular signal and a GPS signal to a public safety command center;
 - determining at the public safety answering center if the GPS signal is sufficient to determine a location of the transceiver;
 - transmitting, if the GPS signal is not sufficient for determining the location of the transceiver, a request signal from the public safety command center to the transceiver ;
 - in response to the request signal, automatically moving the GPS antenna from a docked position relative to a housing of the transceiver to a deployed position relative to the housing of the transceiver; and
 - automatically transmitting a further GPS signal to the public safety answering center.

19. A method for determining the location of a portable handheld two way radio transceiver, comprising the steps of:

transmitting a signal on a cellular frequency from the transceiver to a public safety answering center;

5 transmitting a GPS (Global Positioning System) request from the public safety answering center to the transceiver;

automatically deploying a GPS antenna in the transceiver; and

10 sending a GPS signal from the transceiver to the public safety answering center.

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20. The claim according to claim 19, wherein the method further comprises, after receiving by the transceiver the GPS request from the public answering center, checking a signal strength of a received GPS signal in the transceiver, comparing the signal strength of the received GPS signal to a predetermined
15 threshold, deploying the GPS antenna when the signal strength is below the threshold as determined by the comparison, and sending a new received GPS signal from the transceiver to the public safety answering center.

21. A method for deploying a GPS (Global Positioning System) antenna in an electronic device, comprising the steps of:
- detecting an occurrence of at least one deployment event;
- automatically moving, in response to the detection of an occurrence of
- 5 the at least one deployment event, the GPS antenna from a docked position relative to a housing of the electronic equipment to a deployed position relative to the housing of the electronic equipment, the deployed position of the GPS antenna providing increased signal quality for receiving a GPS signal; and
- 10 transmitting the GPS signal.
22. The device according to claim 21, wherein the GPS antenna is an inflatable antenna that is in a compressed configuration for the docked position and inflated to a monopole GPS antenna configuration for the deployed position.
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23. The device according to claim 21, wherein the occurrence of a deployment event is at least one of activation by a user of at least one predetermined key on the electronic device, activation by the user of a predetermined sequence of keys on the electronic device, and receiving a signal from a public safety
- 20 command center.